Clutter and Realism

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Clutter and Realism

"An investigation on the effect of clutter on the perceived realism of 3d computer generated renderings."

Presentation content:

1. Project introduction
2. Experiment stages
3. Overal conclusions
4. Questions

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Why realism :

" Virtual luminaire prototyping requires a high level of realism of renderings."

Why realism :

" Virtual luminaire prototyping requires a high level of realism of renderings."

Why clutter :

" The presense of less clutter detail speeds up rendering."

One definition :

"Clutter is the number of objects present, relative to the amount of display space available, and their placement in that space relative to the messiness or orderliness of it."

Defined by :

1. *Number of objects*
2. *Angle orientation*
3. *Position of the objects*

One definition :

"Clutter is the number of objects present, relative to the amount of display space available, and their placement in that space relative to the messiness or orderliness of it."

One hypothesis :

"The amount of clutter of objects strongly affects the perception of realism in 3d renderings."

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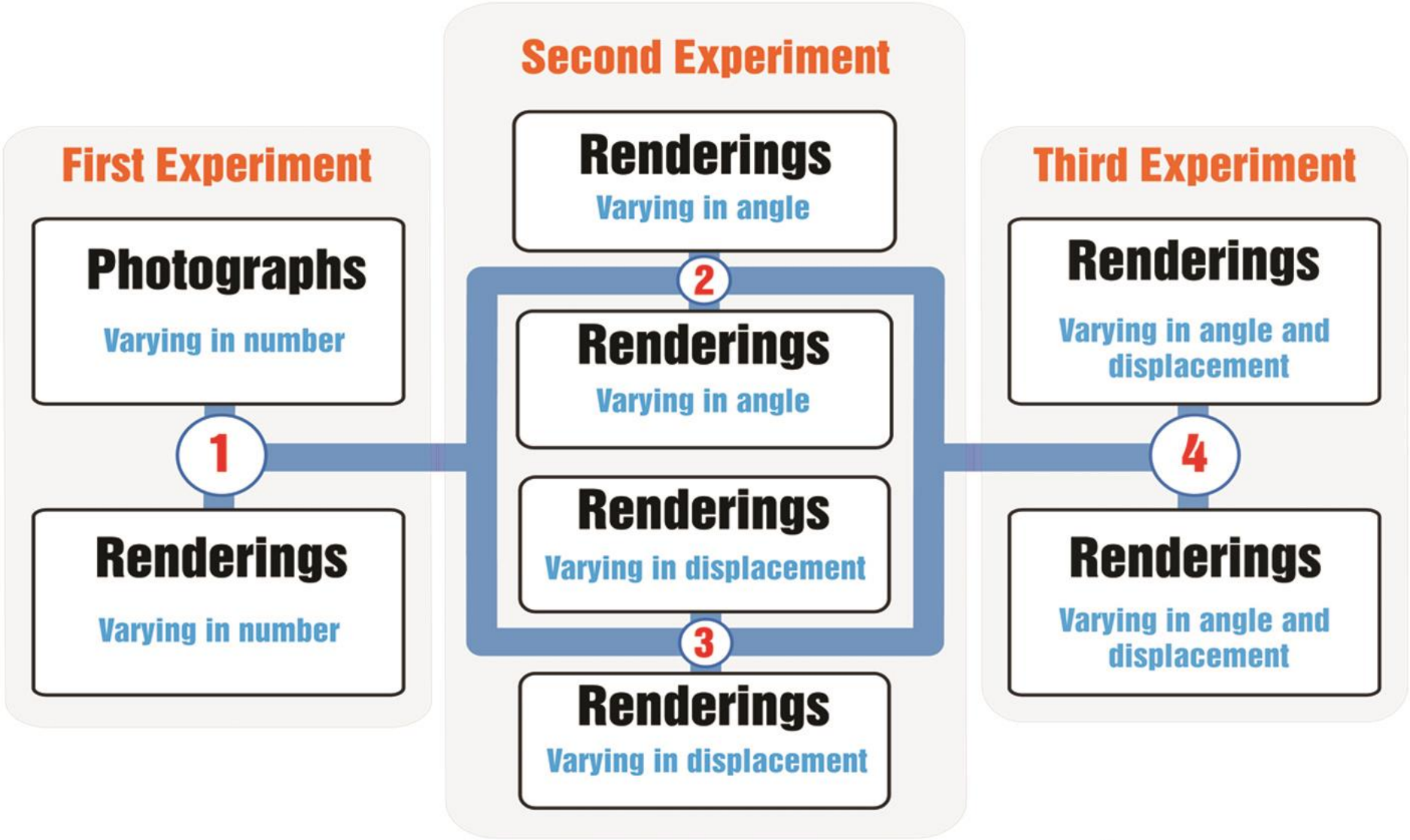
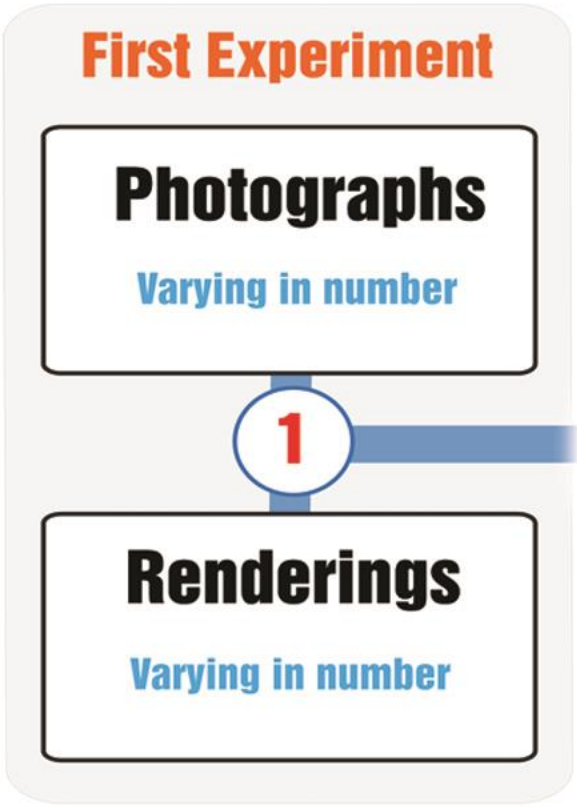
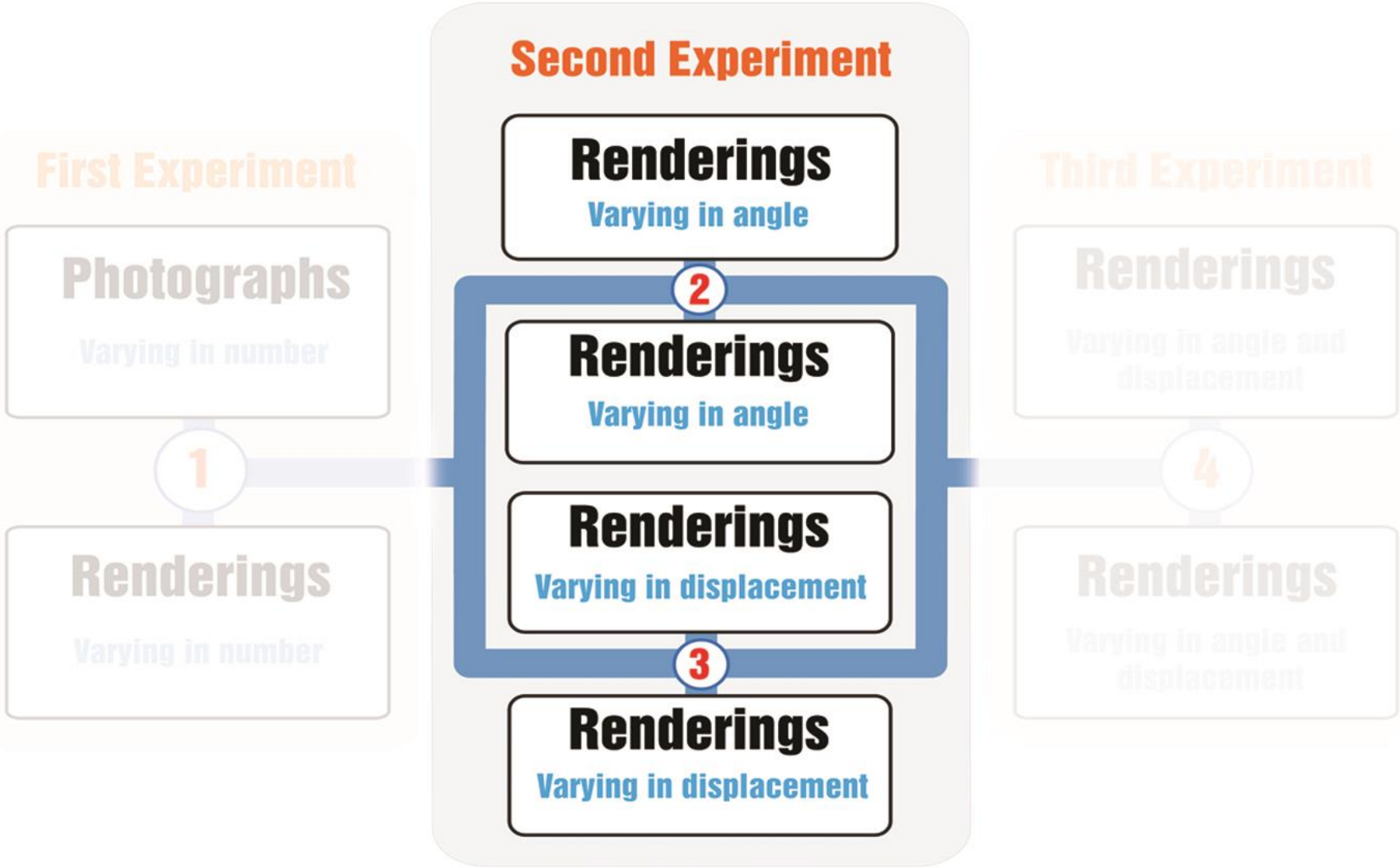
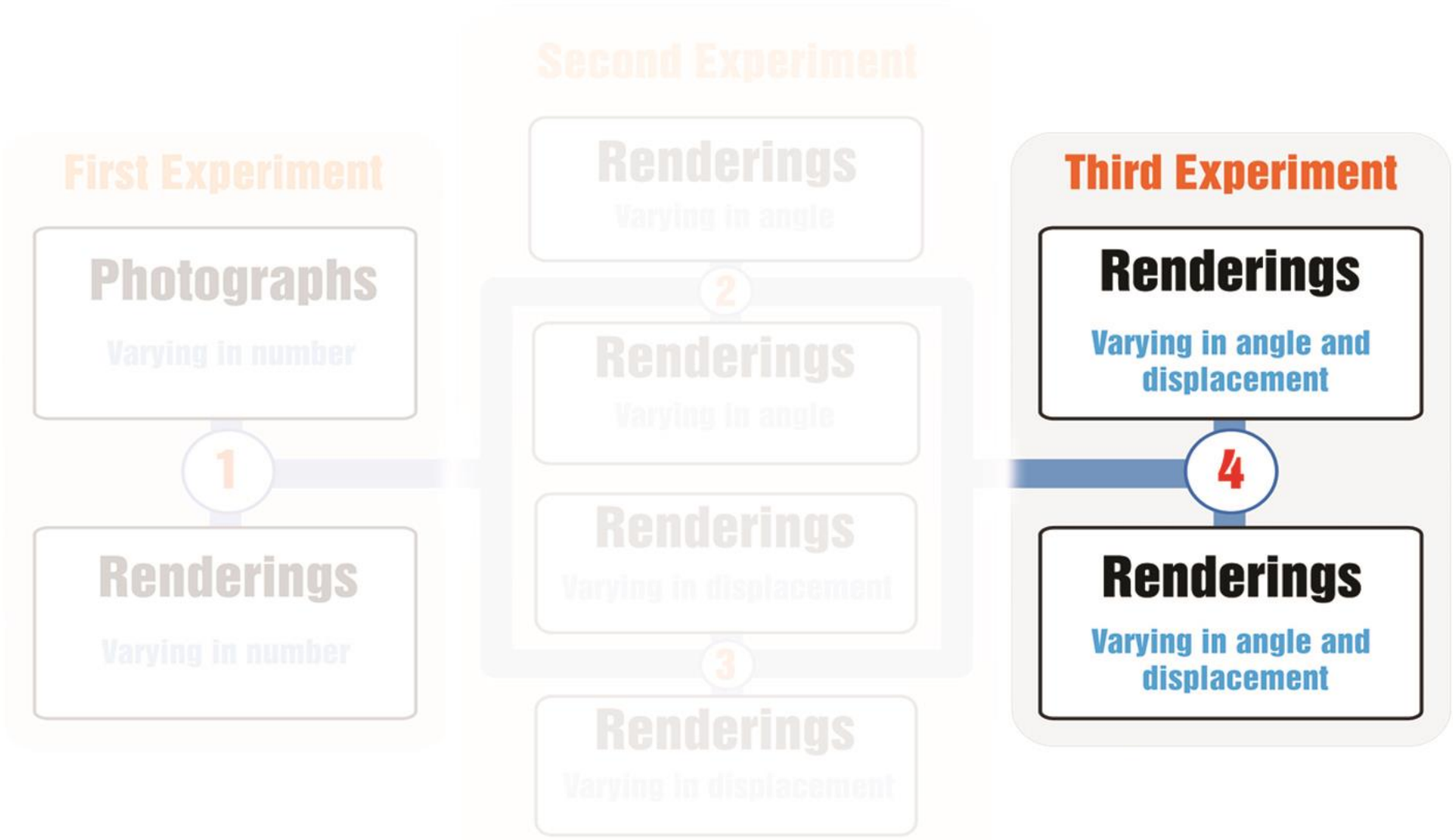
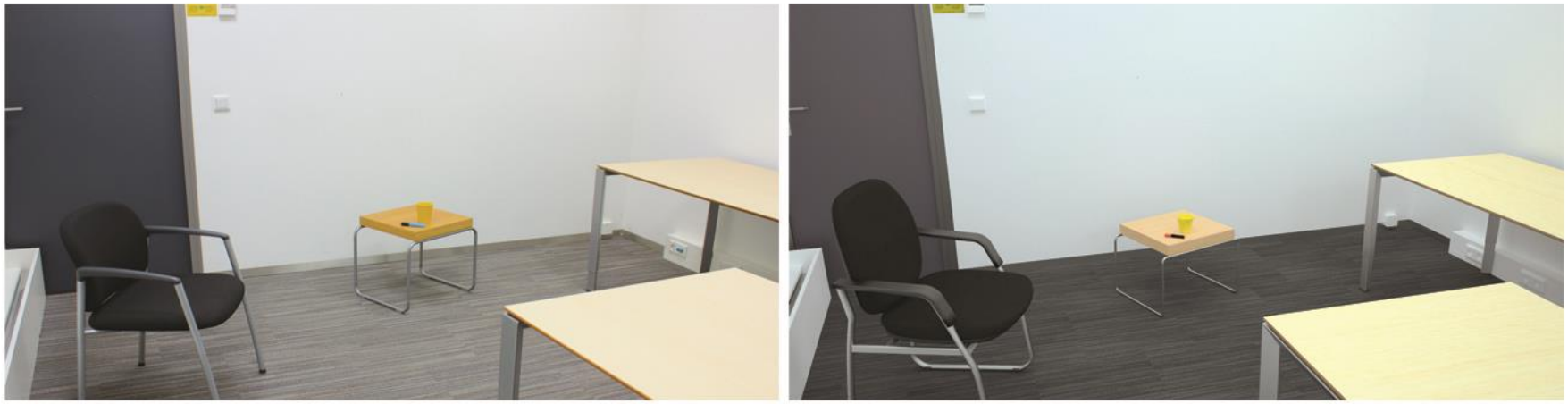

First Experiment
Photographs
Varying in number
1
Renderings
Varying in number
Second Experiment
Renderings
Varying in angle
2
Renderings
Varying in angle
Renderings
Varying in displacement
3
Renderings
Varying in displacement
Third Experiment
Renderings
Varying in angle and displacement
4
Renderings
Varying in angle and displacement


First Experiment
Photographs
Varying in number
1
Renderings
Varying in number


Second Experiment
Renderings
Varying in angle
2
Renderings
Varying in angle
Renderings
Varying in displacement
3
Renderings
Varying in displacement
First Experiment
Photographs
Varying in number
1
Renderings
Varying in number
Third Experiment
Renderings
Varying in angle and displacement
4
Renderings
Varying in angle and displacement

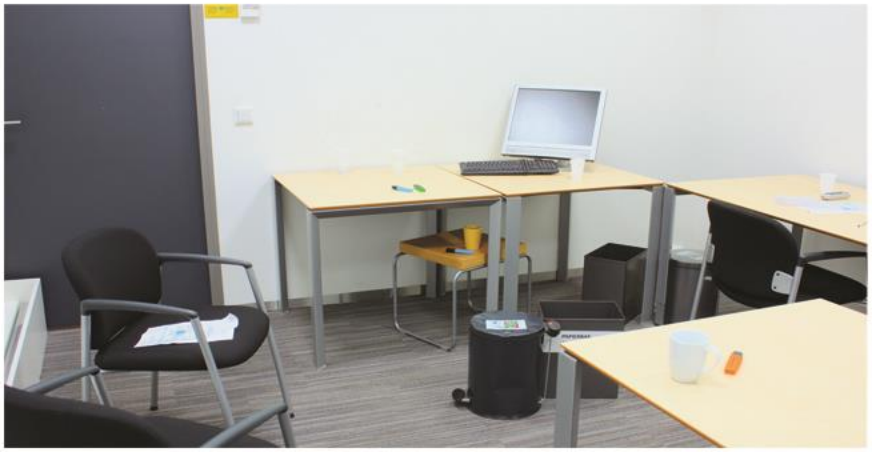

First Experiment
Photographs
Varying in number
1
Renderings
Varying in number
Second Experiment
Renderings
Varying in angle
2
Renderings
Varying in angle
Renderings
Varying in displacement
3
Renderings
Varying in displacement
Third Experiment
Renderings
Varying in angle and displacement
4
Renderings
Varying in angle and displacement

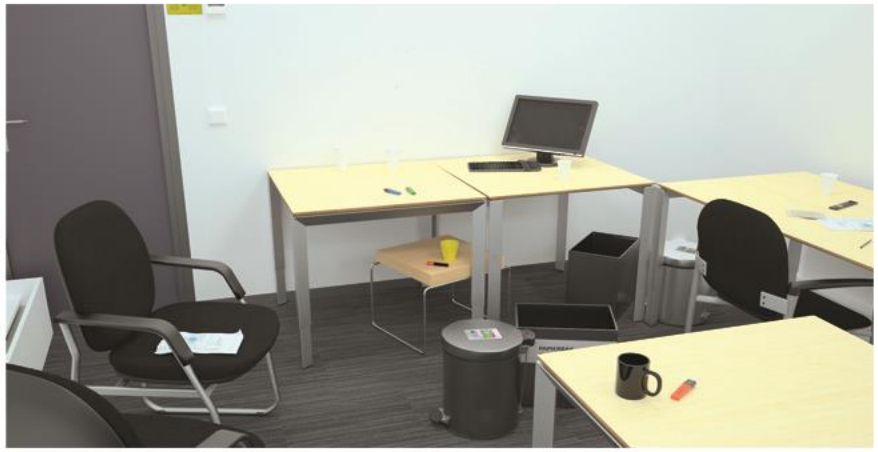
First experiment:
Focus on object number



Clutter level 1 (6 objects in the environment).

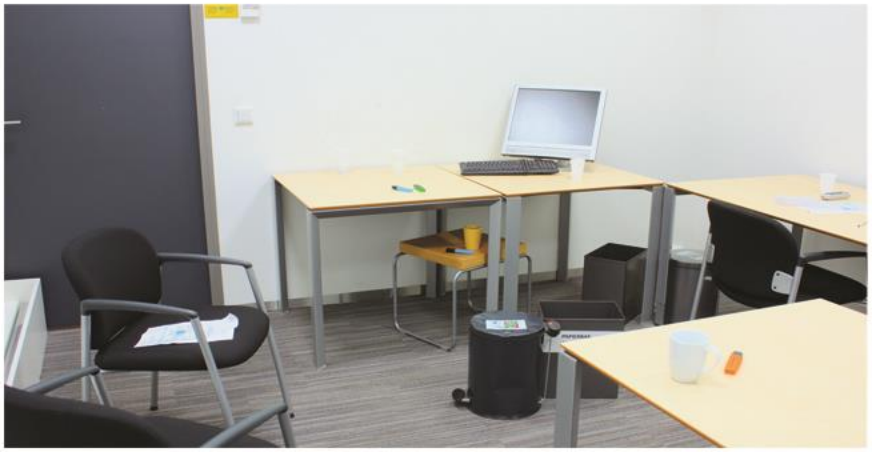
First experiment:
Focus on object number

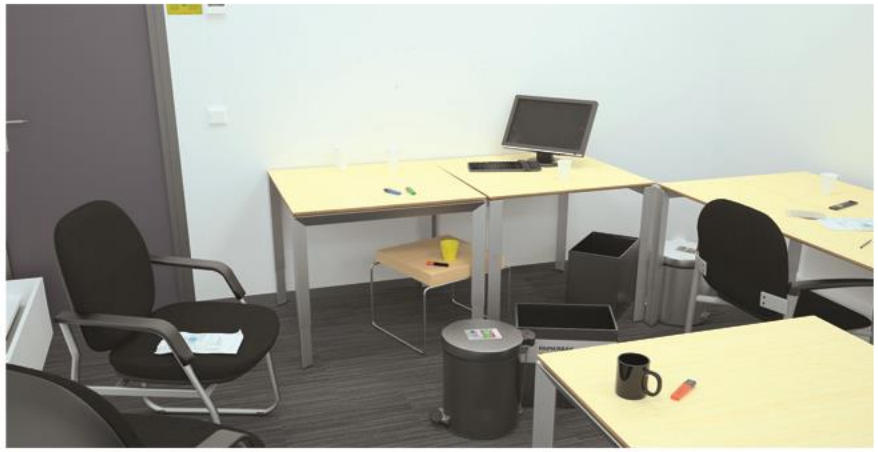




Clutter level 5 (30 objects in the environment).

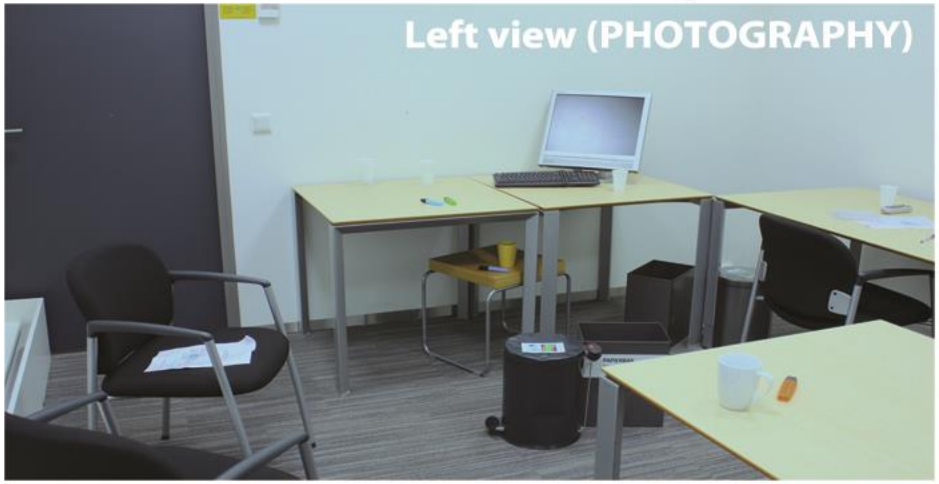
First experiment:
Focus on object number

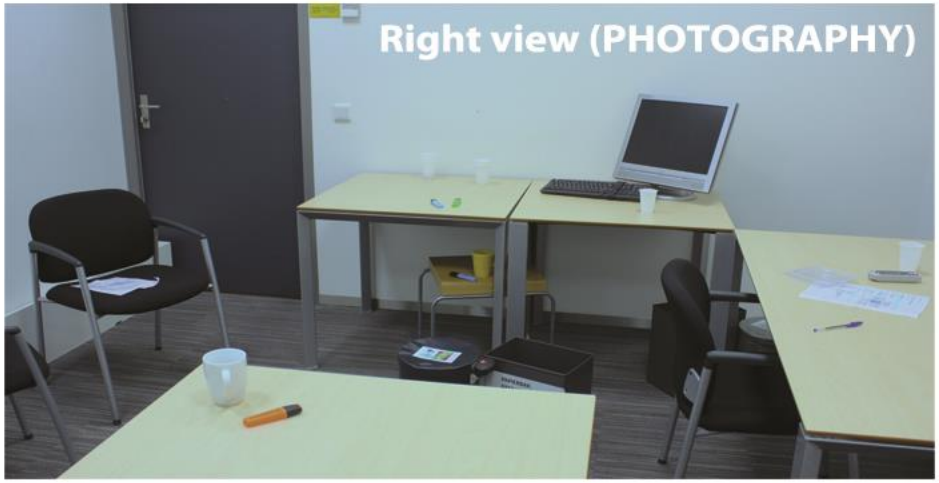


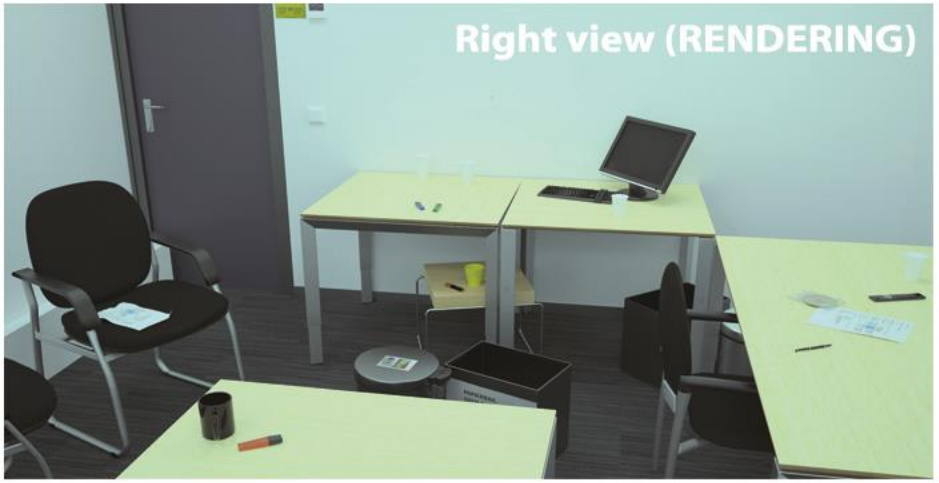


1. Evaluate the overal level of realism of the scene.
2. Evaluate the overal level of clutter of the scene.

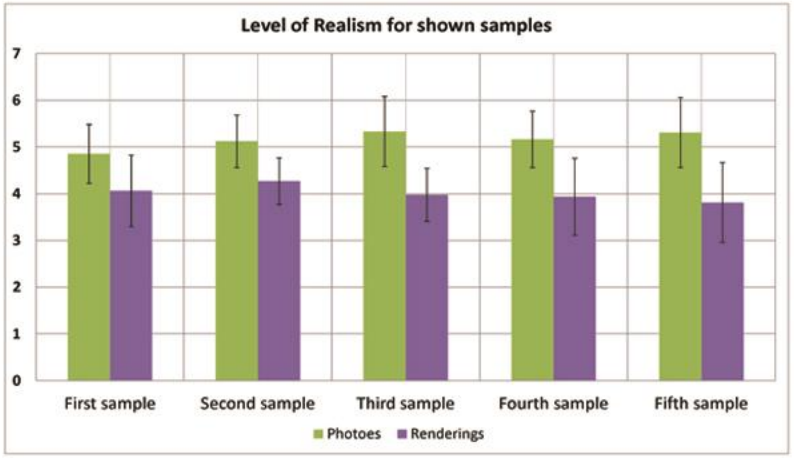
First experiment:

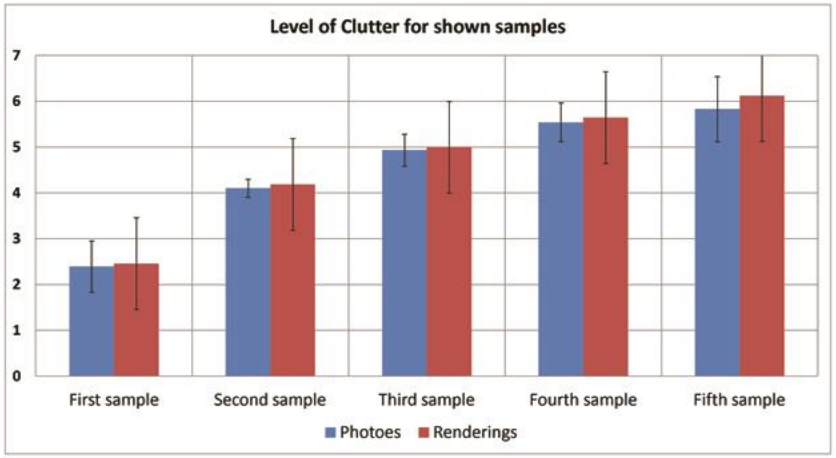






First experiment:
Conclusions





1. Clutter rize with rize in object number.
2. Visual realism shifts not statistically significant.
3. Constant realism of rend. compared to photoes.

Second experiment:

Focus on angle shift

Paired comparison between angle sets.

Second experiment:

Second experiment:

Second experiment:

Second experiment:

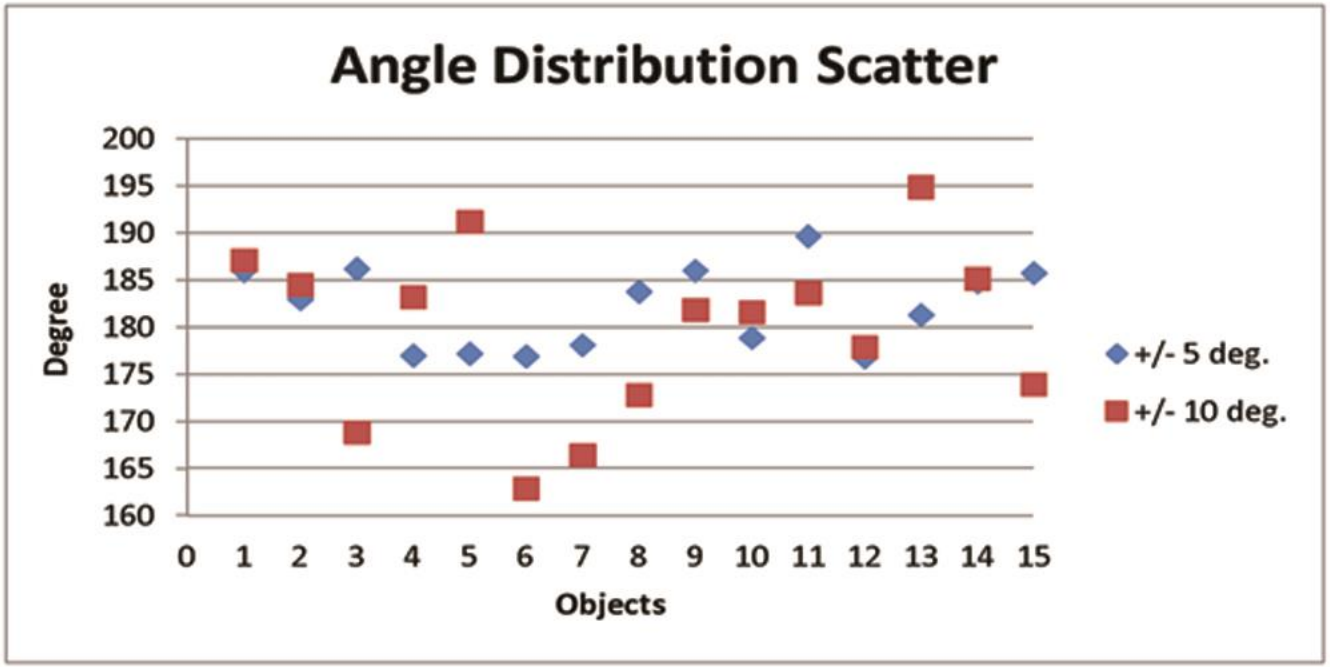
Focus on angle shift

	Object name:	Angle 180	Angle +/- 5	Angle +/- 10
1	Black Mug	180	171.68	171.00
2	Yellow Mug	180	180.08	169.79
3	Disc above	180	176.32	172.28
4	Disc bellow	180	183.61	174.71
5	Keyboard	180	174.96	172.65
7	Sheet 1	180	179.39	182.06
8	Sheet 2	180	180.52	177.01
9	Pen 1 Blue	180	180.48	177.57
10	Pen 2 Green	180	185.38	178.97
11	Pen 3 Brown	180	185.73	187.28
12	Remote Control	180	178.10	159.08
13	Monitor	180	171.25	177.31
14	Marker 1	180	185.98	174.66
15	Marker 2	180	180.40	181.22
16	Marker 3	180	182.71	186.58

Paired comparison between angle sets.

Second experiment:

Focus on angle shift



Paired comparison between angle sets.

Second experiment:

Focus on displacement

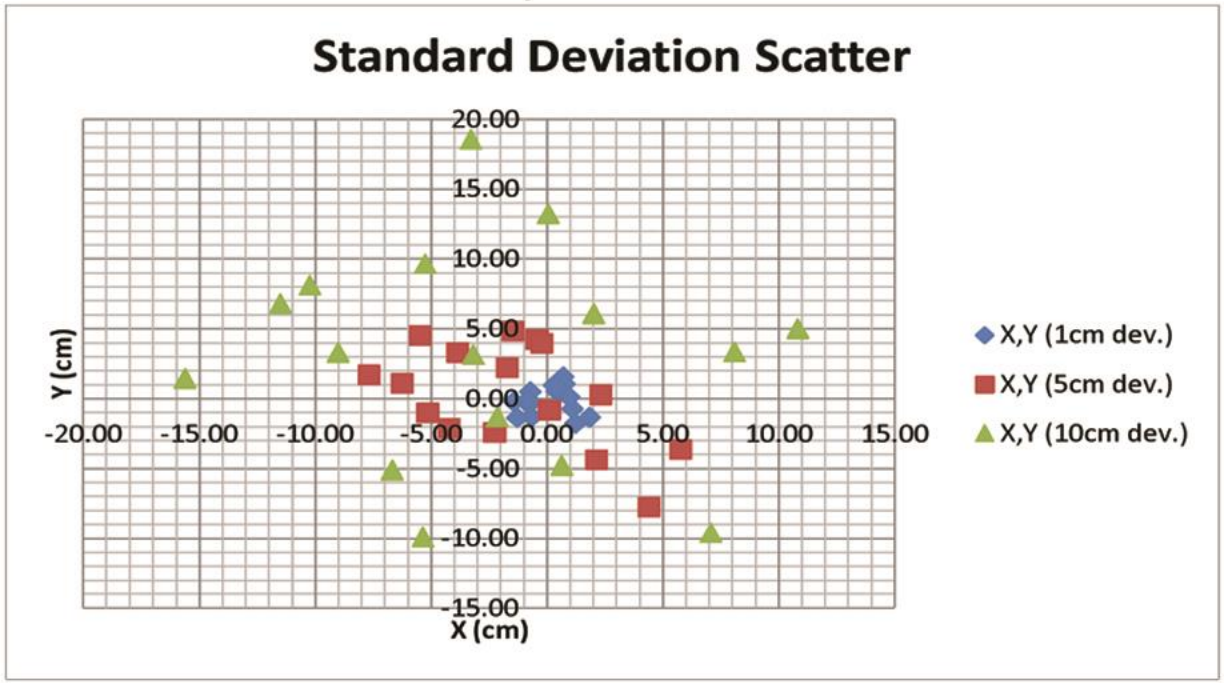
Paired comparison between displacements.

Second experiment:

Second experiment:

Second experiment:

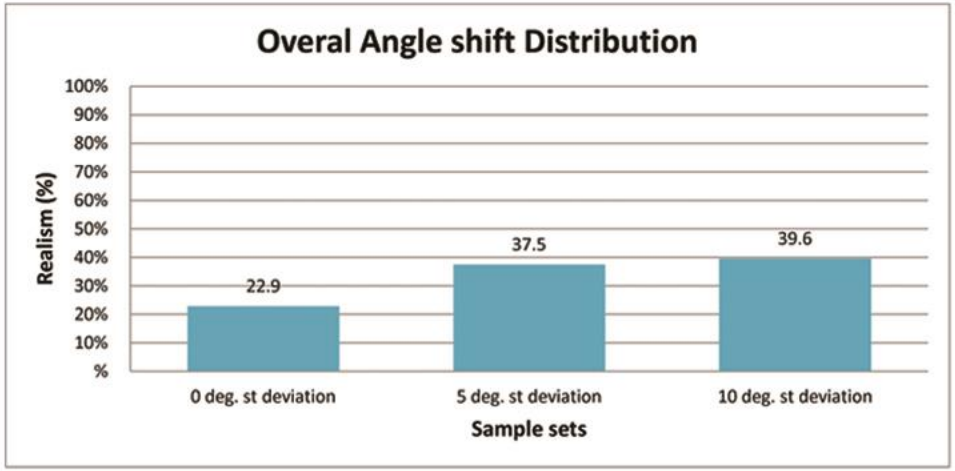
Focus on displacement

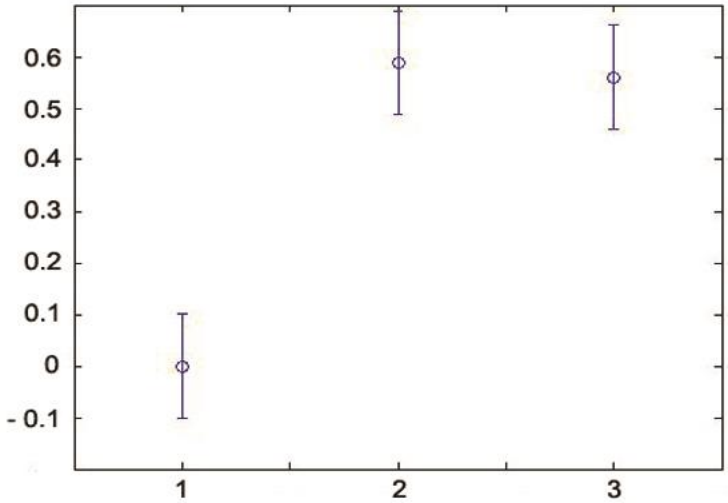


Paired comparison between displacements.

Second Experiment:

Conclusions angle shift

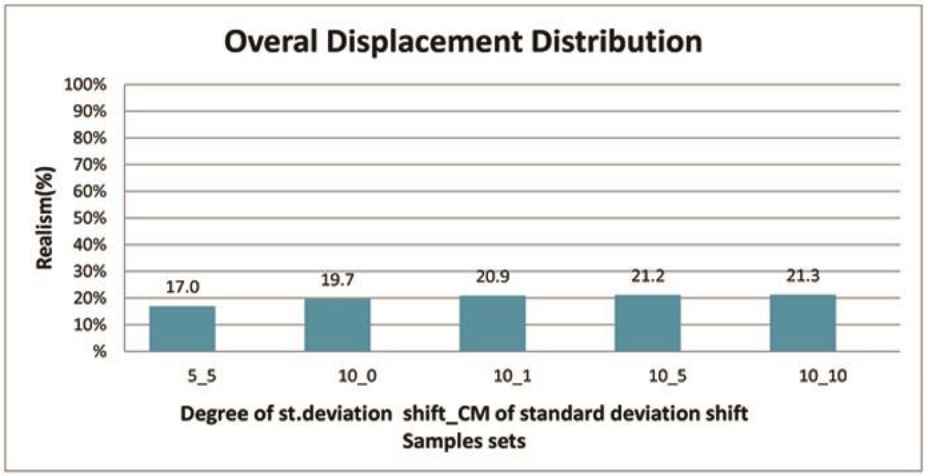


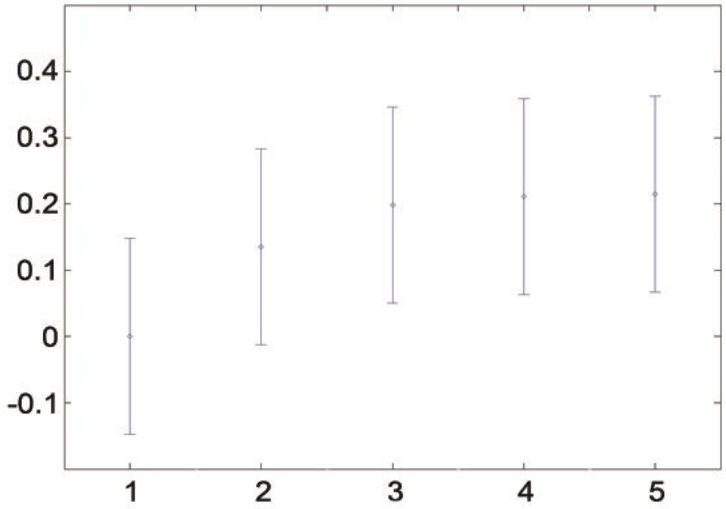


1. Statistically significant results only between 0 deg. of angle shift and the other test samples.
2. A 72 % chance that 2 or 3 would be chosen over 1.

Second Experiment:

Conclusions displacement



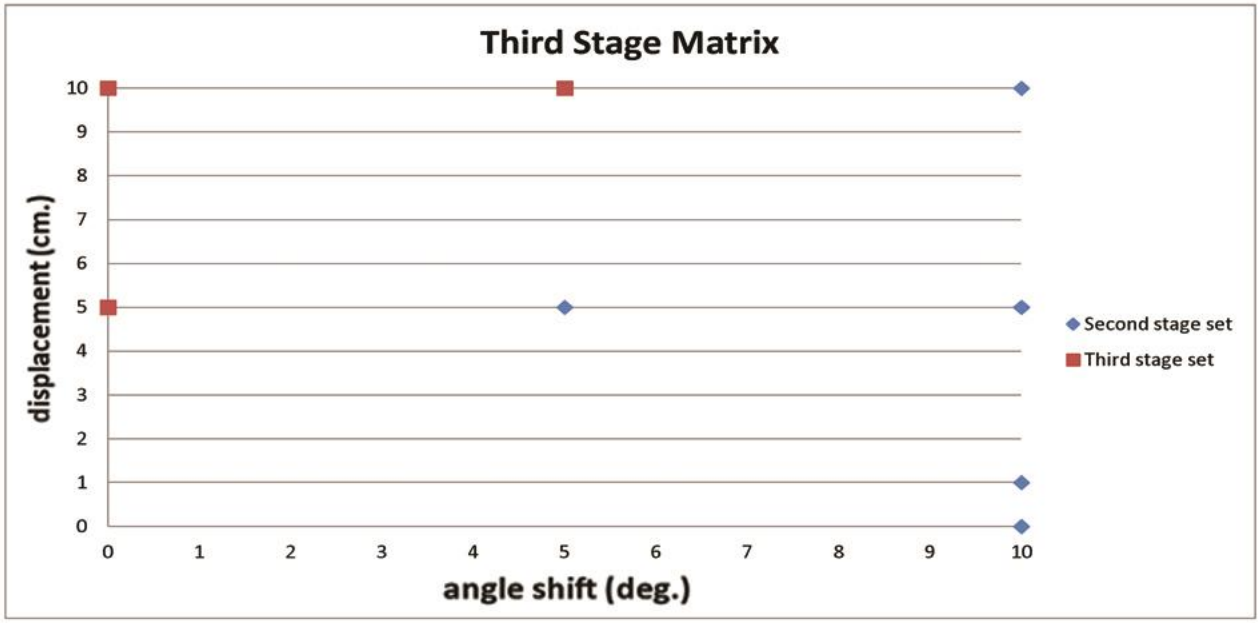


1. Statistically significant results only between sample number 1 and samples 3, 4 and 5.

2. A 57 % chance that 3, 4 or 5 would be chosen over 1.

Third experiment:

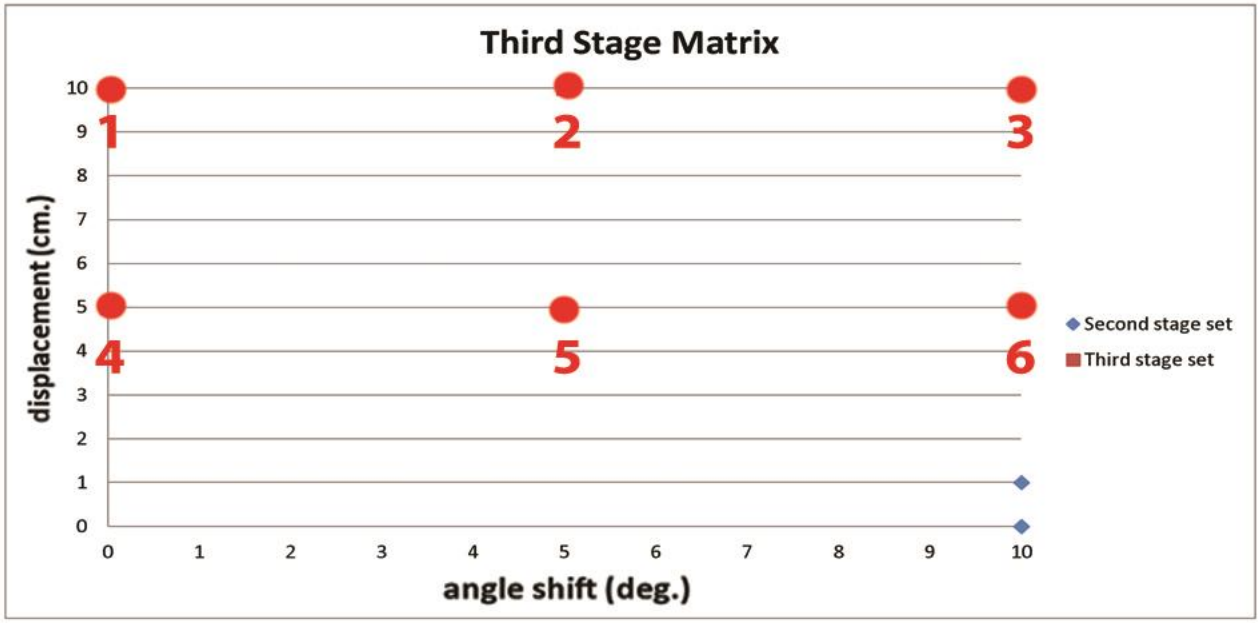
Cross matrix comparison



Paired comparison between all samples.

Third experiment:

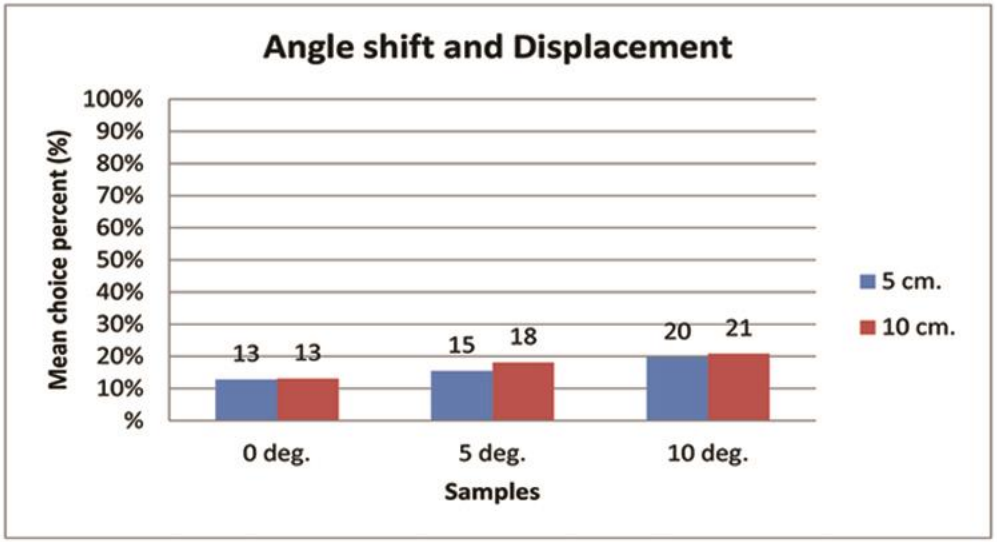
Cross matrix comparison

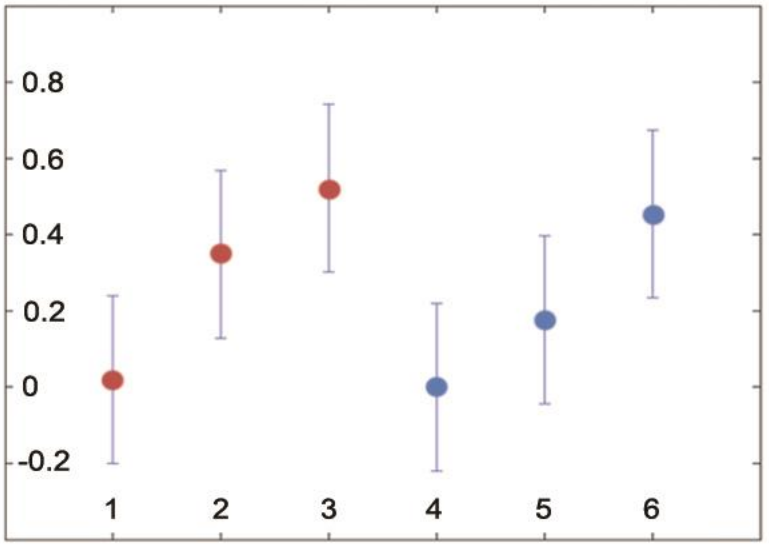


Paired comparison between all samples.

Third Experiment:

Conclusions matrix comparison

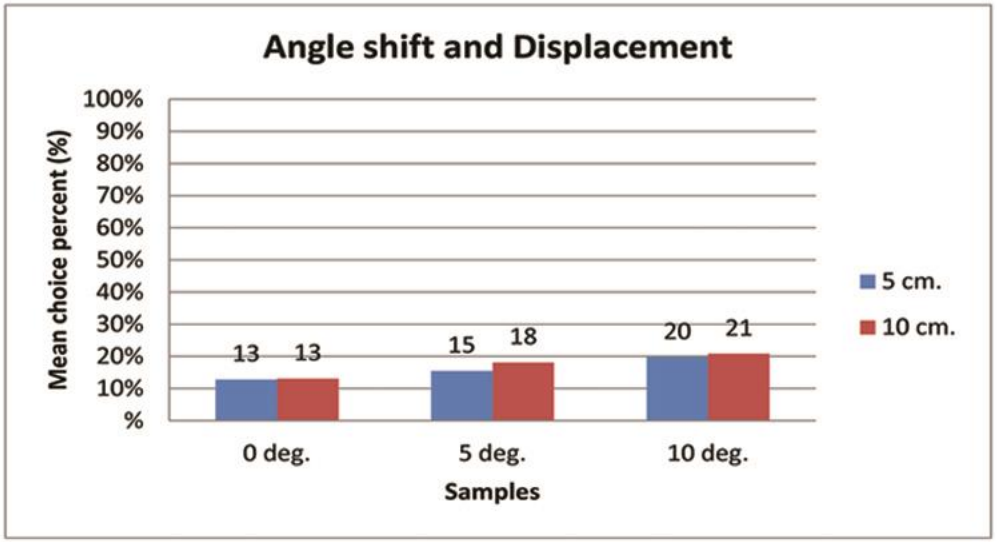


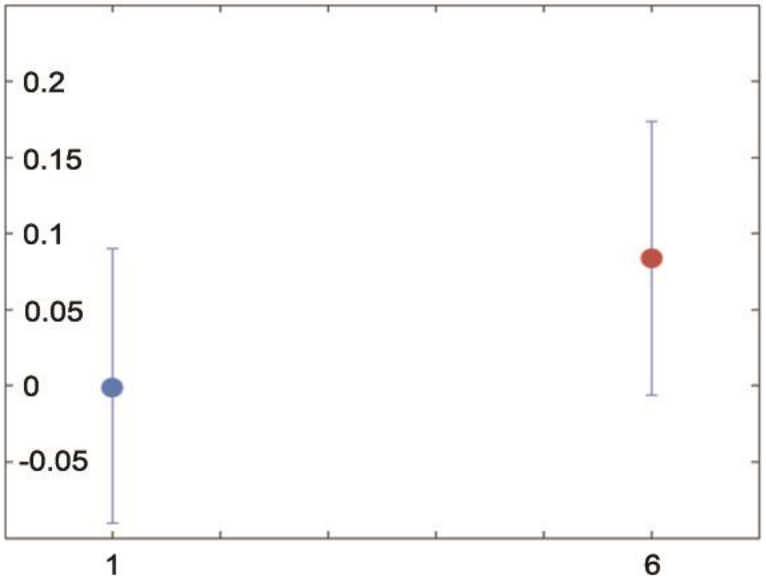


1. A statistically significant result for angle shift.
2. A 68 % chance that image number 6 would be chosen over image number 1.

Third Experiment:

Conclusions displacement

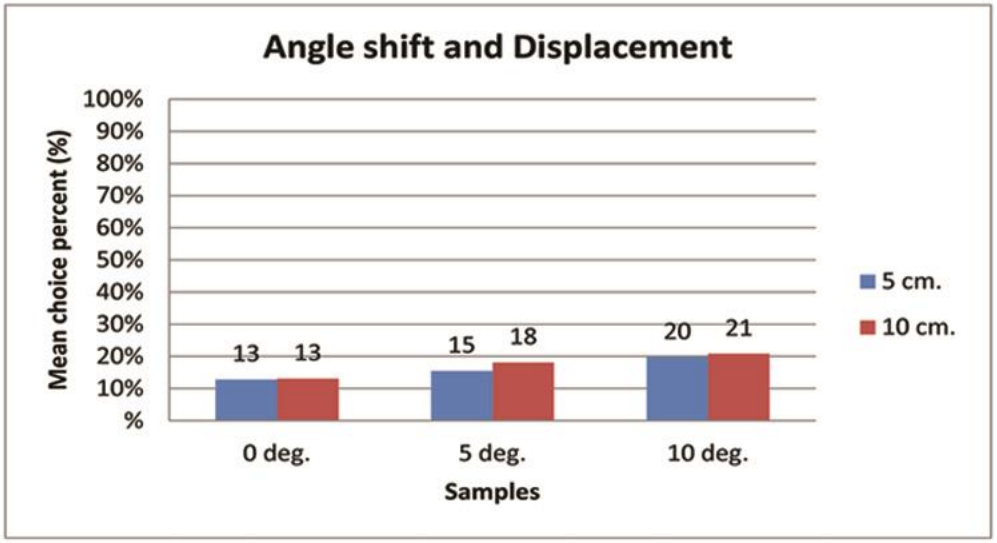


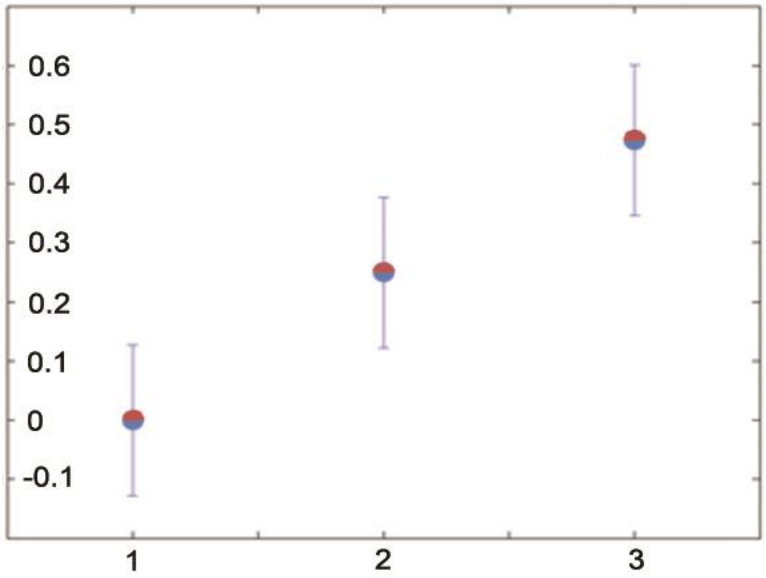


1. No statistical significance for displacement.

Third Experiment:

Conclusions combined angle shift





1. The chance of choice between the samples are 59 % for a one level rise and 68 % for two.

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Overal Conclusions

" Under the conditions set in this experiment the perception of realism is afected by the angle shift while the displacement shows to have no statistically significant effect."

Overal Conclusions

" The perception of realism is not greatly affected by the amount of clutter of objects in 3d scenes. "

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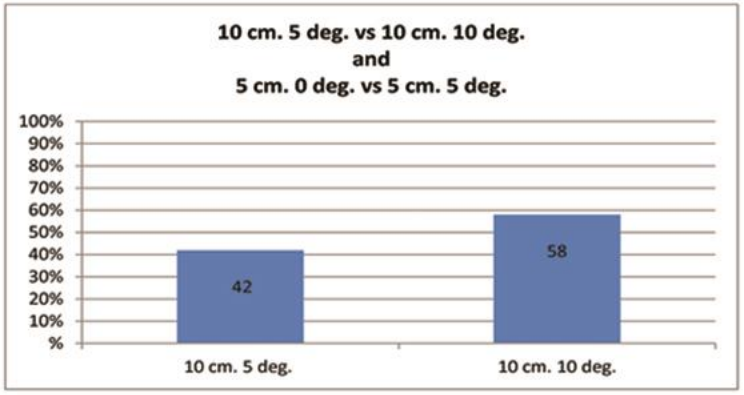
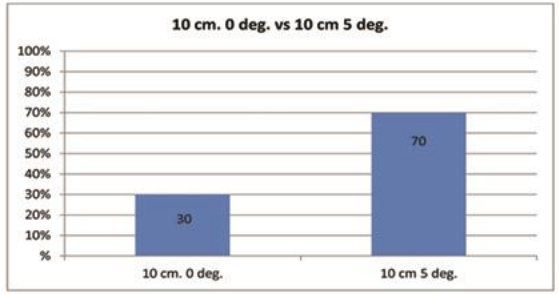
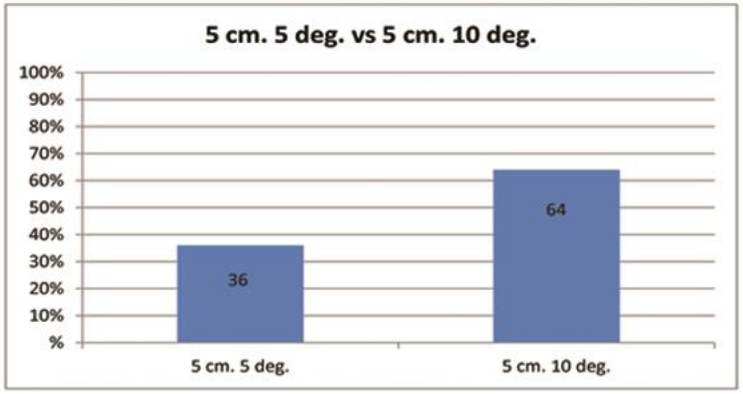
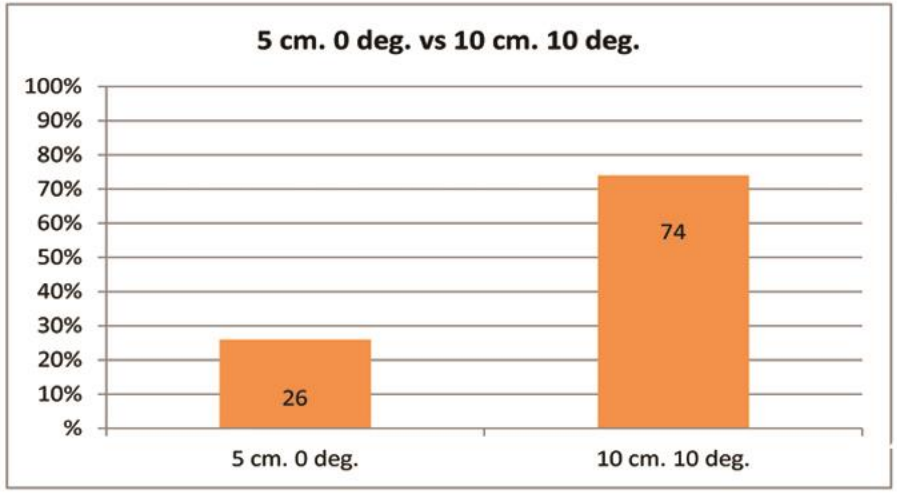
Third Experiment

Additional analysis

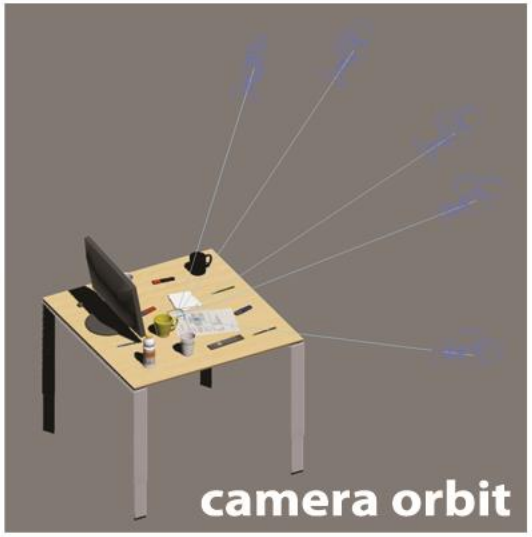






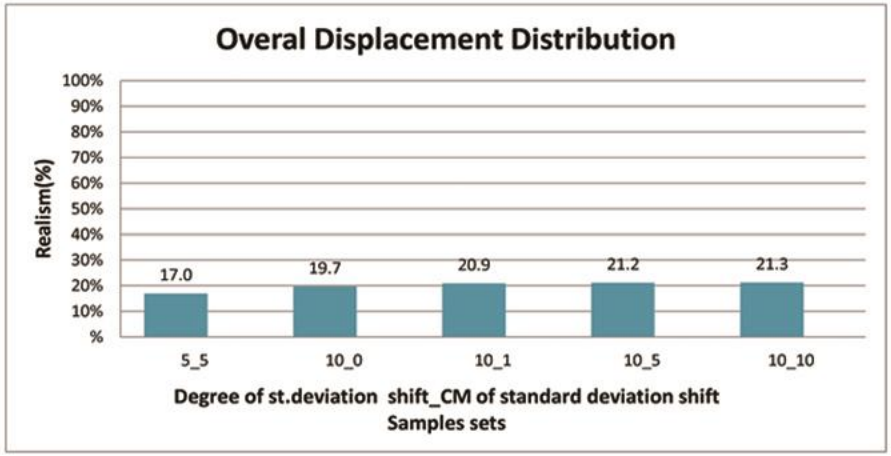


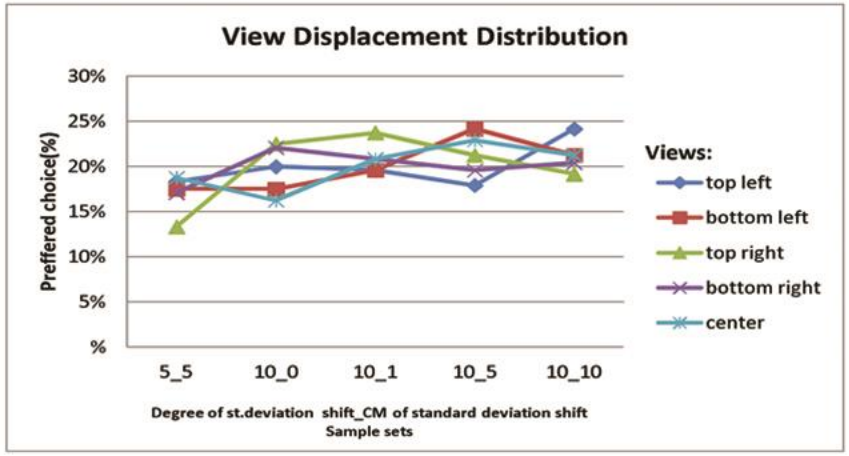
View Analysis

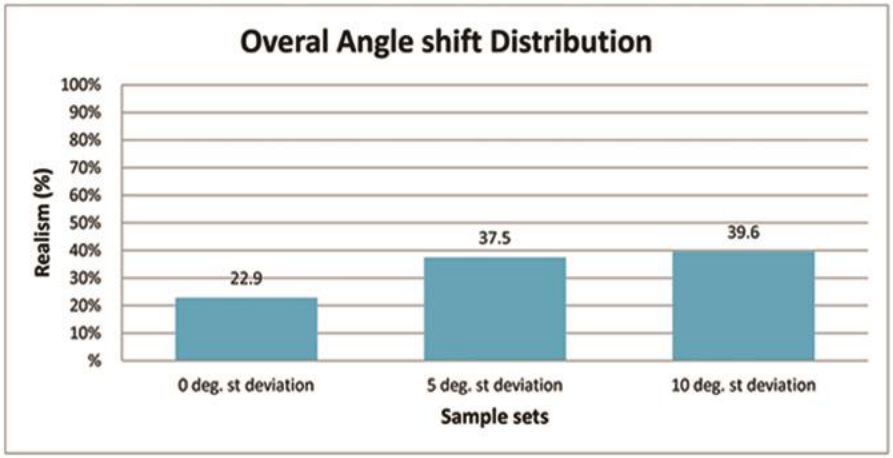


TU Delft

View Analysis







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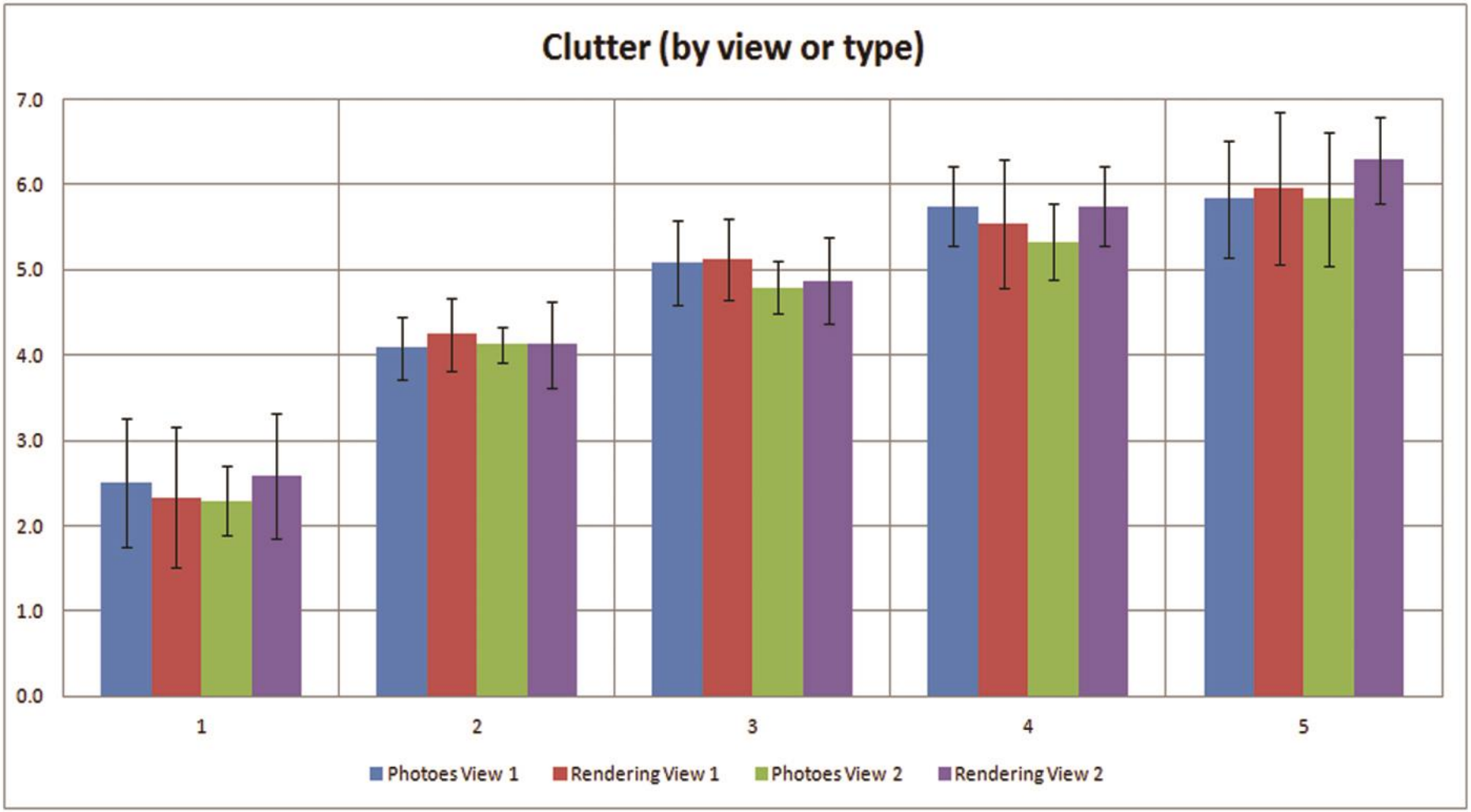

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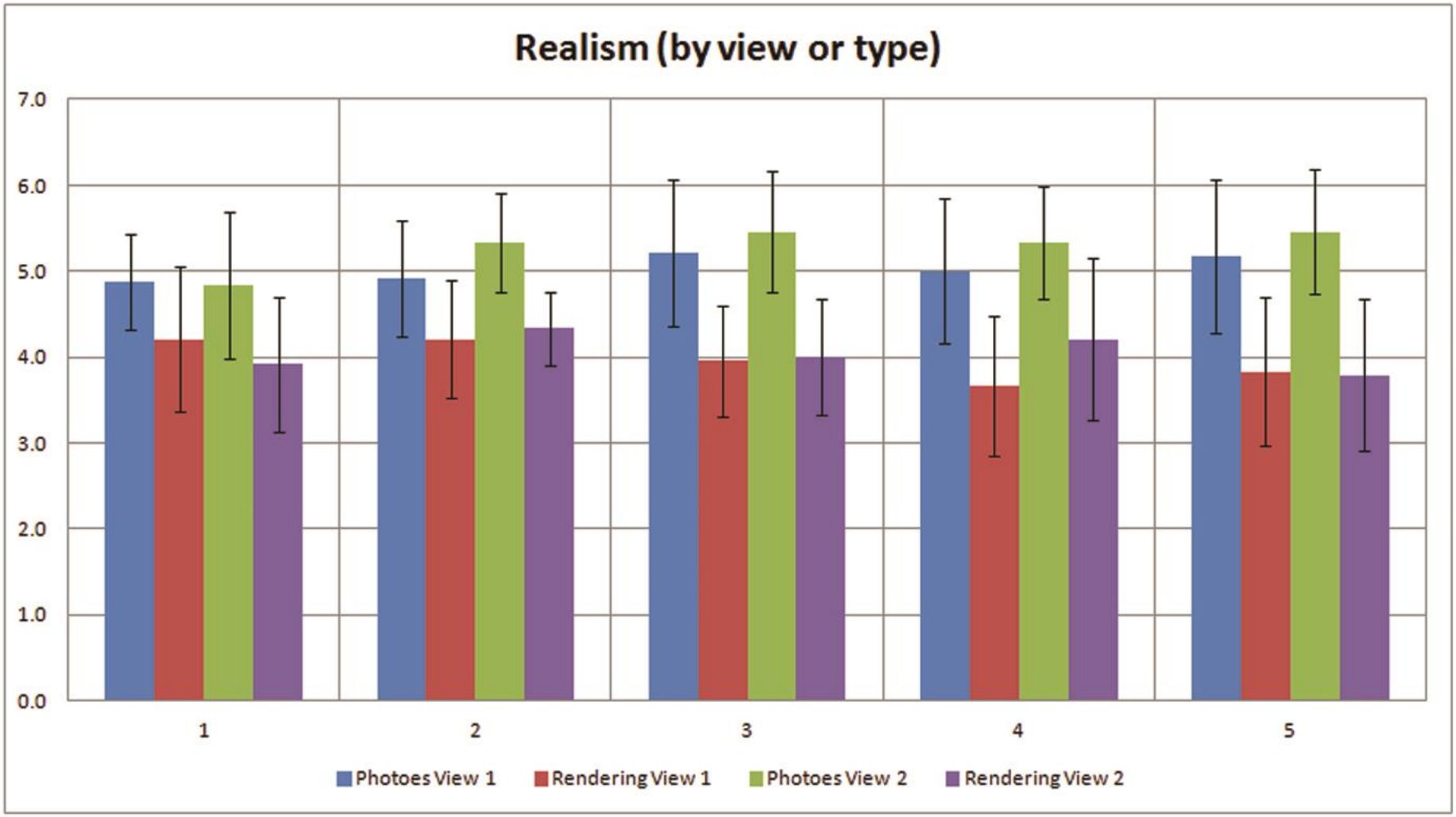

Paperprint Questionaire

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